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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/045,317 | 11/07/2001 | Renyuan Gao | PHX-0038 | 7964 |

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EXAMINER

PAK, SUNG H

| | |
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| ART UNIT | PAPER NUMBER |
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2874

DATE MAILED: 12/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|-------------------------------|----------------------------|--|
| Office Action Summary | Application No. 10/045,317 | Applicant(s) GAO ET AL. | |
| | Examiner Sung H. Pak | Art Unit 2874 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on 22 September 2003.

2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) 1-6 and 8-26 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) 1-6 and 8-26 is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.

13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
 a) ☐ The translation of the foreign language provisional application has been received.

14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

| | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Applicant's amendment filed 9/22/2003 has been entered and all pending claims have been carefully reconsidered. In view of the amended limitations, previous ground of rejection has been withdrawn. However, the pending claims are still unpatentable. Therefore, a new ground of rejection is furnished in this office action. Please refer to Remarks for detailed discussion.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-6, 8-9, 11-12, 14-16, 18-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xu et al (US 2003/0207215 A1) in view of Boek et al (US

6,418,261 B1).

Boek et al reference was cited in the previous office action.

Xu et al reference discloses an optical device with all the limitations set forth in the claims, except it does not teach that the coefficient of thermal expansion of the substrate differs from that of the lower cladding by less than 40%.

Nevertheless, Xu et al does disclose: a polymer substrate having a first coefficient of thermal expansion (paragraph 0130); a lower cladding disposed on the substrate, the lower cladding being a first perhalogenated polymer (paragraph 0105); a polymer core disposed on at least a portion of the lower cladding (paragraph 0107); wherein the core is a second perhalogenated polymer (paragraph 0107); wherein the coefficients of thermal expansion of polymer materials are between 50-300 parts per million per degree Celsius (Fig. 39); wherein the polymer substrate is polycarbonate (paragraph 0131); wherein the polymer material and lower cladding are blends of at least two polymer groups (paragraph 0134); wherein the lower cladding is deposited onto the substrate via spincoating and evaporating the solvents (paragraphs 0104, 0105, 0110).

On the other hand, Boek et al reference explicitly teaches the use of an optical waveguide substrate and the first cladding layer having coefficient of thermal expansion difference less than 40% (column 3 lines 1-5). Boek et al teach that such CTE values are advantageous over the prior art because it reduces warpage and polarization sensitivity of a planar waveguide device. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Xu et al

device to have coefficient of thermal expansion of the waveguide substrate and the lower clad layer differing less than 40%.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Xu et al and Boek et al as applied above, further in view of Livesay et al (US 2003/0038251 A1).

Xu et al and Boek et al, as applied above, disclose an optical device with all the limitations set forth in the claims, except they do not explicitly teach the use of poly[2,2,4-trifluoro-5-trifluoromethoxy-1,3-dioxole-co-tetrafluoroethylene], i.e. HYFLON® by Ausimont, Inc. However, the use of HYFLON® in optical waveguide production is known in the prior art as discussed by Livesay et al (paragraph 0069). The use of HYFLON® is advantageous because it allows for thin film waveguide production with low cost and relative ease. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Xu et al device to have HYFLON® material.

Claims 13, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xu et al and Boek et al.

Xu et al and Boek et al reference disclose an optical device with all the limitations set forth in the claims as discussed above, except it does not teach the use of rare earth dopant to amplify transmitted optical signal. However, the use of rare earth dopant in waveguide amplifier application is well known and common in optical device art. Such rare earth dopants are advantageously used to amplify transmitted optical signal which

reduces transmission error and maintains optical signal strength. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Xu et al device to have rare earth dopants in the waveguide core.

Remarks

Claims 1-6, 8-26:

The claims are amended to recite, inter alia, an optical device comprising a substrate "having a first coefficient of thermal expansion and a lower cladding having a second coefficient of thermal expansion differing from the first coefficient of thermal expansion by less than approximately 40%." Due to the amendment, the previous ground of rejection (based on 35 USC 102(e)) is hereby withdrawn. However, the pending claims are still unpatentable. A new ground of rejection based on 35 USC 103(a) is provided in this office action in response to the amendment.

Claim 7:

The claim was rejected based on 35 USC 103(a) in the previous office action. The applicant has argued that this rejection is in error. The examiner withdraws this ground of rejection. However, the claim 7 has been cancelled by the amendment, and the issue is therefore, moot.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sung H. Pak whose telephone number is (703) 308-4880. The examiner can normally be reached on Monday - Thursday : 6:30am-5:00pm.

The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

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Sung H. Pak
Examiner
Art Unit 2874

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Rodney Bovernick
Supervisory Patent Examiner
Technology Center 2800